

Canon Paleo Curriculum

Lesson Plan 3

Unit: 2

Florissant Tree Rings

Students will have a chance to see pre- and misconceptions evolve through personal experience.

Supplies:

Per group of four students:

- one worksheet
- one modern ring
- one petrified tree ring

Preparation:

Read the Background material by Kate Gregory and go over that material along with the basic tree information below.

Terms and Info about Tree Rings

A. Terms

1. Bark
 - a. Protects the tree from disease and pests
2. Phloem
 - a. Transports food to the roots
3. Cambium
 - a. Only part of tree that produces new cells.
4. Xylem (Sapwood)
 - a. Transports water to the leaves
5. Heartwood
 - a. Dead, inner portion of tree.
6. Pith
 - a. Center of tree.

B. Tree Ring Info

1. All tree rings are found in the xylem and heartwood.
2. Tree rings are produced by the cambium.
3. Light, wide rings are called "earlywood"
 - a. Produced during early part of growing season
4. Dark, thin rings are called "latewood"
 - a. Produced at the end of the growing season

C. Climate

1. In most cases, wetter, more favorable years produce thicker earlywood rings.
2. More info on climate to follow during our trip to the park!

Concept:

Students will:

- observe how similar species in different climates grow differently.
- begin to understand how climate is reflected in tree ring size.
- review observation and inference.

Activity:

Have students mark significant areas of climate change.

Observation and Inference Review

- Hand out “tree cookie sheets” to groups of 4 students.
- After a few minutes, write each group’s observations on the board.
- Inquire about inferences that might follow from their observations.
- Have back up inferences if the students don’t come up with any.

Tree Ring Worksheet

- Working in groups of four, answer the question in the worksheet.
- Groups will count and mark the tree rings from the right side towards the center on both sets.
- On the modern tree rings have the groups come up with events that happened during some of the years they have marked.

IV. How old is old?

- Discuss the concepts of Deep Time, as it relates to the difference between historical time (written history) and geologic time (the geologic time scale).

Tree Rings Studies

The modern and petrified tree rings before you holds keys to the past. Locked in their cells is information about growing conditions, age, wet and dry seasons, and maybe more, but we need to ask the right questions if we are to learn from them.

1. What do we want to know?

2. What do we observe?

Qualitative:

Quantitative (remember to label your measurements with units):

3. How might we go about answering our questions? What else do we need to know?

4. What observations and inference can we make about how the modern tree rings compare to the petrified tree rings?

Tree Rings Studies - Key

The stump before you holds keys to the past. Locked in its petrified cells is information about growing conditions, age, wet and dry seasons, and maybe more, but we need to ask the right questions if we are to learn from them.

1. What do we want to know?

- **How old was the tree when it died? How long ago did it die? How did it die?**
- **How tall was the tree? What species is it? Why is the stump as big as it is?**
- **Why are there different colors?**
- **What is this tree's story, what happened to it?**
- **Has this tree moved since it fossilized, and where are the rest of the trees in the forest?**
- **What was the weather like?**
- **What was the climate like? "Was it happy?"**

Observations

2. What do we observe?

Qualitative:

- **Living things on the tree. Multi-colored. Hard or petrified. There are tree rings visible. The tree has flaked along the rings. The rings are different sizes.**
- **The tree feels cool, and is rough in some places and smooth in others.**
- **The tree is large.**

Quantitative (remember to label your measurements with units):

Have student average a set of ten random tree ring for each sample

3. How might we go about answering our questions? What else do we need to know?

Missing Information

Make more measurements. Compare it to other trees. Compare it to the closest living relative. Compare rings to information from living species about weather.

4. What observations and inference can we make about how the modern tree rings compare to the petrified tree rings?

Observations:

- **The petrified tree has wider tree rings.**
- **There seems to be fewer in the same rings in the same amount of area.**
- **The color is different.**

Inferences:

- **The petrified tree seems to be in a wetter climate.**
- **The petrified tree seems to have had better growing conditions**
- **The air that the petrified tree was exposed to could have had more carbon dioxide.**



Petrified Tree Rings



Modern Tree Rings